Prescott. It is not clear what particular point is meant by Pima; there are many stations of that name in Arizona, but none of them very near to Prescott; the Weather Bureau voluntary station "Pima" is about 200 miles to the southeast of Prescott. This hailstorm seems to have occurred within the area of low pressure at the head of the Gulf of California, and while an area of high pressure was moving southward over the Rocky Mountains.

In general, the areas covered by destructive hailstorms, when they occur in the United States, are but a few square miles. Now that the prevention of a hailstorm by the Stiger method of cannonading begins to be advocated, it becomes important for us to know the total area covered by such storms in each State annually, also the number of storms at any one place, and the average frequency of their occurrence per year or decade. We hope that our section directors will be able to give some attention to these statistics, so that we may have some basis upon which to figure out whether it would be economical to go to the expense of preventing hail, assuming that we had an infallible method. Of course, where land is worth less than $5 per acre, and the annual crop from that land worth less than $10 per acre, it would be foolish to spend $100 per acre annually in protecting from hailstorms.

## ATMOSPHERIC CONDITIONS FAVORABLE TO COTTON SPINNING.

Mr. Lee A. Denson, Observer, Weather Bureau, at Meridian, Miss., favorably indorses the following remarks of Mr. Louis Cohn of that place, extracted from a paper read by him on July 10 before the Young Men's Business League.

Among the advantages of the South for the manufacture of cotton are * * * (8) mildness of climate peculiarly adapted to the proper manipulation of the delicate fiber, and also a saving of large expense in heating the manufacturing establishments. * * * The natural advantages of Meridian for the manufacture of the cotton fiber result from its peculiar physical location. Being almost entirely surrounded by hills and thus within a large basin, the moisture in the atmosphere is retained to a remarkable degree. The average conditions of the atmosphere, as found in Meridian, are such as are much sought by all *intelligently-conducted cotton manufacturing plants*, and large sums are invested for securing such conditions artificially as are here furnished by nature. It is the atmospheric conditions found in the Lancashire and Manchester sections of England and at Fall River, Mass., that have made those districts so celebrated for the manufacture of southern goods, and investigation will disclose the fact that Meridian possesses this essential requisite to a greater degree than possibly any other locality in the South.

Mr. Denson, in commenting on this paper, says:

With Mr. Cohn, I, also, am firmly convinced that the general atmospheric conditions of Meridian are considerably influenced by the topographical surroundings. * * * I believe that the conditions are sufficiently well marked to warrant an investigation. It is a well-known fact that the temperature at Meridian with a northerly wind, is lower than at neighboring stations in the same latitude; this fact is also shown by the effect on fruit, as peaches are often killed here when trees beyond the hills on the south bear abundantly.

We understand that a relative humidity of 70 per cent, a temperature above 50° F., and freedom from atmospheric electricity, are the favorable conditions for cotton spinning, and that these are frequently secured by artificial means in those cotton factories that are not favorably located as to average climate.

It is not clear to us that the desired moderate temperatures and rather high relative humidity are secured by the establishment of a factory or a manufacturing town in a large basin surrounded by hills. There is no apparent reason why the moisture of the atmosphere should be especially retained by this arrangement; it is easily carried away by the wind. Such basins are usually hot and dry in the middle of the day, but cool and damp in the night-time and early morning. If the temperature at Meridian is really cooler with a northerly wind than at neighboring stations, we should be rather inclined to attribute this local coolness, as well as the accompanying humidity, to topographic conditions. We hope that Mr. Denson will furnish us with fuller data as to the relative humidity and temperature during the 10, 12, or 14 hours of factory work.

## AURORA IN FLORIDA.

On page 582 of the Annual Summary for 1899, Mr. H. H. Ten Broeck gives some account of an unusual aurora observed by him at Braidentown, Fla. In a recent letter he says:

I was formerly an observer for the Smithsonian Institution. In regard to the aurora of November 18, 1899, I would add that the next day I saw a press dispatch from Birmingham, Ala., reporting an extraordinary appearance observed at that place. The intelligent observer said that the bands of light were about 2 feet wide. The light was observed there over two hours before it was seen by me. This appears to show that the aurora is sometimes local and that its center is moving over the land. I have seen it stated repeatedly that the center of the aurora is over the earth's magnetic pole, but in this present case evidently it could not have been so.

The numerous notes on auroras in the MONTHLY WEATHER REVIEW for 1895–96 have already shown that it frequently happens that auroras appear almost simultaneously in very restricted localities, although these may be widely separated from each other. The atmospheric conditions favorable to aurora formation almost always move slowly southward over the United States from New York and New England to Virginia at rates that correspond fairly well with the motion over Alabama and Florida on November 18, 1899.

## PROGRESS IN WIRELESS TELEGRAPHY.

The following extracts from an article signed G. E. W. published in the Electrical World and Engineer, New York, August 18, page 252, seem to have been written by one in authority and desirous of saying the very best that can be said for the Marconi system of wireless telegraphy, especially as developed and modified by the engineers of the British army. The Weather Bureau will undoubtedly adopt some style of wireless telegraphy for communication with ships at sea as soon as apparatus has been devised that is reasonably economical and reliable, but we are not yet sure that Marconi's is the best. The following are the extracts referred to:

* * * * * * *

Signor Marconi did not go to South Africa personally, but several of his assistants went there with several outfits of wireless telegraphy, and they operated in conjunction with the fleet patroling the coast. They confined their attention exclusively to sending messages between the several warships and between the fleet and the shore. At Delagoa Bay the British admiral sent messages a distance of 80 miles to the fleet off shore. The British battleship *Hannibal* also sent and received messages to and from the battleship *Jupiter*, when under way, over a distance of 32 miles. One message was sent 100 miles, the greatest distance successfully covered.

While there were none of his assistants with the land forces in South Africa, his system of telegraphy was used by Lord Roberts, and a modification of it by General Baden-Powell. * * * Upon assuming command in South Africa, he (Lord Roberts) summoned a body of wireless telegraphers and kept them in his camp all through the struggle. These experts kept him in touch with the various units of his enormous army, and some of the messages were sent overland a distance of 60 miles. There are ten sets of instruments in Lord Roberts's army, and these have been developed successfully. All scientific questions and experiments made by a rapidly-moving army are of necessity scantily reported by a commander in the field, and the accounts of the tests with the wireless telegraphy are still quite vague. Considerable interest will be shown in the official reports of the operators when the war has terminated, and no one will hail the accounts of the experiments with more concern than the inventor.

One important improvement in the system in war times was made through the cooperation of the hero of Mafeking. The difficulty of sending messages any great distance in a mountainous country like